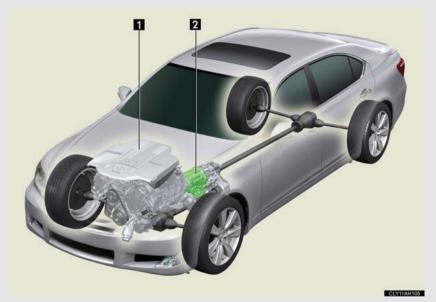
Hybrid system

Your vehicle is a hybrid vehicle. It has characteristics different from conventional vehicles. Be sure you are closely familiar with the characteristics of your vehicle, and operate with care.

The hybrid system combines a gasoline engine and an electric motor (traction motor) according to driving conditions, improving fuel efficiency and reducing exhaust emissions.

1 Gasoline engine

2 Electric motor (Traction motor)

When stopped/during start-off

The gasoline engine stops when the vehicle is stopped. During start-off, the electric motor (traction motor) drives the vehicle. At slow speeds or when traveling down a gentle slope, the engine is stopped and the motor is used.

During normal driving

The gasoline engine is predominantly used. The electric motor (traction motor) charges the hybrid battery as necessary.

When accelerating sharply

The power of the hybrid battery (traction battery) is added via electric motor (traction motor) to that of the gasoline engine.

When braking (Regenerative braking)

The electric motor (traction motor) charges the hybrid battery (traction battery).

Regenerative braking

The motor generator converts kinetic energy to electric energy when:

- The accelerator pedal is released.
- The brake pedal is depressed with the shift lever in "D", "S" or "R".

Conditions in which the gasoline engine may not stop

The gasoline engine starts and stops automatically. However, it may not stop automatically in the following conditions:

- The gasoline engine is warming up.
- The hybrid battery (traction battery) is being charged.
- The hybrid battery (traction battery) temperature is low or high.

■ Charging the hybrid battery (traction battery)

- As the gasoline engine charges the hybrid battery (traction battery), the battery does not need to be charged from an outside source. However, if the vehicle is left parked for a long time the hybrid battery will slowly discharge. For this reason, be sure to drive the vehicle at least once every few months for at least 30 minutes or 10 miles (16 km). If the hybrid battery becomes fully discharged and you are unable to jump-start the vehicle with the 12-volt battery, contact your Lexus dealer.
- If the shift lever is in “N”, the hybrid battery (traction battery) will not be charged. When driving in heavy traffic, operate the vehicle with the shift lever in “D” or “S” to avoid discharging the battery.
- To help prevent the 12-volt battery from becoming discharged, drive the vehicle at least once a month, and operate the accessories only when the “READY” indicator is on. When parking the vehicle, make sure the doors and trunk are closed and all lights are turned off.

■ Charging the 12-volt battery

→P. 536

■ After the 12-volt battery has discharged or has been changed or removed

The gasoline engine may idle at times when it usually would not. The vehicle idles continuously in order to re-learn the engine operating conditions and this does not indicate a malfunction. If this continues for more than a few days, contact your Lexus dealer.

■ Sounds and vibrations specific to a hybrid vehicle

There may be no engine sounds or vibrations even though the vehicle is able to move. Always put the shift lever in “P” when parked.

The following sounds or vibrations may occur when the hybrid system is operating, and are not a malfunction:

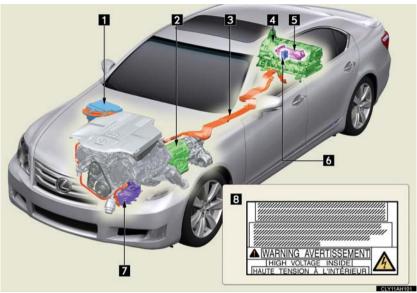
- Motor sounds may be heard from under the vehicle.
- Sounds may be heard from the hybrid battery (traction battery) behind the rear seat when the hybrid system starts or stops.
- Sounds may be heard from the transmission when the hybrid system starts or stops.
- Engine sounds may be heard when accelerating sharply.
- Sounds may be heard due to energy regeneration when you depress the brake pedal.
- Vibration may be felt when the gasoline engine starts or stops.
- You may hear cooling fan sounds coming from the air intake vents behind the rear seat.

■ Hybrid battery (traction battery) cooling

The air conditioning system may operate automatically to cool the hybrid battery (traction battery).

■ Maintenance, repair, recycling, and disposal

Contact your Lexus dealer regarding maintenance, repair, recycling and disposal. Do not dispose of the vehicle yourself.

High voltage components

1 Power control unit

2 Electric motor (Traction motor)

3 High voltage cables (orange color)

4 Hybrid battery (Traction battery)

5 DC/DC converter

6 Service plug

7 Air conditioning compressor

8 Caution label

Take care when handling the hybrid system, as it contains a high voltage system (about 650V at maximum) as well as parts that become extremely hot when the hybrid system is operating. Obey the caution labels attached to the vehicle.

■ Hybrid battery air vents

There are air intake vents on the package tray for the purpose of cooling the hybrid battery (traction battery). If the vents become blocked, the hybrid battery may overheat, leading to a reduction in hybrid battery output.

Emergency shut off system

The emergency shut off system blocks off the high voltage current and stops the fuel pump to minimize the risk of electrocution and fuel leakage when a certain level of impact is detected by the impact sensor. If the emergency shut off system activates, your vehicle will not restart. To restart the hybrid system, contact your Lexus dealer.

Energy monitor/consumption screen

You can view the status of your hybrid system on the multi-information display (→P. 211) and the touch screen (→P. 338). The following images are examples only, and may vary slightly from actual conditions.

Energy monitor

● How to display on the touch screen:

STEP 1 Press “INFO/PHONE” beside the touch screen.

STEP 2 Touch “Fuel Consumption” on the “Information” screen.

If the “Energy Monitor” screen does not appear, touch “Energy”.

● How to display on the multi-information display:

Press the “DISP” switch on the steering wheel several times to select the energy monitor display.

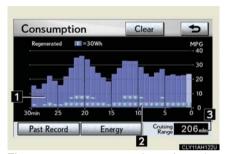
	Touch screen	Multi-information display
When the vehicle is powered by the electric motor (traction motor)		
When the vehicle is powered by both the gasoline engine and the electric motor (traction motor)		
When the vehicle is powered by the gasoline engine		

	Touch screen	Multi-information display
When the vehicle is charging the hybrid battery (traction battery)	Energy Monitor / BATTERY / ENGINE / ELECTRIC MOTOR / Consumption / Past Record / CLY11AH214U	
	Energy Monitor / BATTERY / ENGINE / ELECTRIC MOTOR / Consumption / Past Record / CLY11AH215U	
When there is no energy flow	Energy Monitor / BATTERY / ENGINE / ELECTRIC MOTOR / Consumption / Past Record / CLY11AH216U	
Hybrid battery (traction battery) status	Low ↔ Full	Low ↔ Full

Consumption

STEP 1 Press “INFO/PHONE” beside the touch screen.

STEP 2 Touch “Fuel Consumption” on the “Information” screen.

If the “Consumption” screen does not appear, touch “Consumption”.

1 Fuel consumption in the past 30 minutes

2 Regenerated energy in the past 30 minutes

One symbol indicates 30 Wh. Up to 4 symbols are shown.

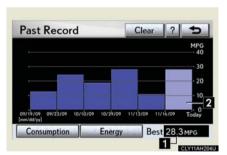
3 Cruising range

These images are examples only, and may vary slightly from actual conditions.

Past record

STEP 1 Press “INFO/PHONE” beside the touch screen.

STEP 2 Touch “Fuel Consumption” on the “Information” screen.

If the “Past Record” screen does not appear, touch “Past Record”.

1 Best past fuel consumption

2 Average fuel consumption

Displays the average fuel consumption between each reset of the average fuel consumption on the multi-information display.

When resetting, if the average consumption is better than the best past fuel consumption will be updated.

These images are examples only, and may vary slightly from actual conditions.

Resetting the consumption data

Selecting “Clear” on the “Consumption” screen will reset the average fuel consumption. Selecting “Clear” on the “Past Record” screen will reset the past records. Selecting “Yes” will confirm resetting of all the data (except cruising range).

Hybrid warning message

A message is automatically displayed when a malfunction occurs in the hybrid system or an improper operation is attempted.

If a warning message is shown on the multi-information display, read the message and follow the instructions.

■ **If a warning light comes on or a warning message is displayed, or the 12-volt battery is disconnected**

The hybrid system may not start. In that case, try to start the system again. If the "READY" indicator does not come on, contact your Lexus dealer.

■ **When refueling, the fuel filler door may take a few moments to open**

As part of emission system operation, it may take up to 10 seconds for the fuel filler door to automatically release after the opener switch is pressed. Before refueling is possible, a message will be shown on the multi-information display. (→P. 128)

■ **Running out of fuel**

When the vehicle has run out of fuel and the hybrid system cannot be started, refuel the vehicle with at least enough gasoline to make the low fuel level warning light (→P. 508) go off. If there is only a small amount of fuel, the hybrid system may not be able to start. (The minimum amount of fuel to add to make the low fuel level warning light go out is about 3.4 gal. [13 L, 2.8 Imp. gal.], when the vehicle is on a level surface. This value may vary when the vehicle is on a slope.)

■ **Hybrid battery (traction battery)**

The hybrid battery (traction battery) has a limited service life. The lifespan of the hybrid battery (traction battery) can change in accordance with driving style and driving conditions.

CAUTION

High voltage precautions

The vehicle has high voltage DC and AC systems as well as a 12-volt system. DC and AC high voltage is very dangerous and can cause severe burns and electric shock that may result in death or serious injury.

- Never touch, disassemble, remove or replace the high voltage parts, cables and their connectors.
- The hybrid system will become hot after starting as the system uses high voltage. Be careful of both the high voltage and the high temperature, and always obey the caution labels attached to the vehicle.

- Never try to open the service plug access hole located behind the rear seat. The service plug is used only when the vehicle is serviced and is subject to high voltage.

CAUTION

■ **Road accident cautions**

Observe the following precautions to reduce the risk of injury:

- Pull your vehicle off the road, put the shift lever in "P", apply the parking brake, and turn the hybrid system off.
- Do not touch the high voltage parts, cables and connectors.
- If electric wires are exposed inside or outside your vehicle, an electric shock may occur. Never touch exposed electric wires.
- If a fluid leak occurs, do not touch it as it may be strong alkaline electrolyte from the hybrid battery (traction battery). If it comes into contact with your skin or eyes, wash it off immediately with a large amount of water or if possible, boric acid solution. Seek immediate medical attention.
- If a fire occurs in the hybrid vehicle, leave the vehicle as soon as possible. Never use a fire extinguisher that is not meant for electric fires. Using even a small amount of water may be dangerous.
- If your vehicle needs to be towed, do so with four wheels raised. If the wheels with the electric motor (traction motor) are on the ground when towing, the motor may continue to generate electricity. This may cause an electricity leakage leading to a fire. (→P. 497)

■ **Nickel-metal hydride battery**

Your vehicle contains a sealed nickel-metal hydride battery. If disposed of improperly, it is hazardous to the environment and there is a risk of severe burns and electrical shock that may result in death or serious injury.

■ **Emergency shut off system**

- Carefully check to see if there are exposed high voltage parts or cables. Never touch the parts or cables. (→P. 40)
- Carefully inspect the ground under the vehicle. If you find that liquid has leaked onto the ground, the fuel system may have been damaged. Leave the vehicle as soon as possible.

NOTICE

■ **Hybrid battery air vents**

- Do not put foreign objects over the air vents. The hybrid battery (traction battery) may overheat and be damaged.
- Clean the air vents regularly to prevent the hybrid battery (traction battery) from overheating.
- Do not wet the air vents. It may cause a short circuit and damage the hybrid battery (traction battery).
- Do not carry large amounts of water such as water cooler bottles in the vehicle. If water spills over the hybrid battery (traction battery), the battery may be damaged.